

CLAIMS:

1. An optical disc apparatus for recording and/or reproducing information, comprising:

- a supporting assembly;

5 - a spindle motor, associated with the supporting assembly, having a spindle with a spindle axis for rotating an optical disc supported by the spindle about the spindle axis;
- an optical lens unit associated with the supporting assembly for scanning an information surface of said optical disc, and comprising:

10 - a focussing lens assembly with a movable focussing lens having a focussing lens area bounded by a focussing lens periphery and a focussing axis intersecting said focussing lens area, said focussing lens assembly being adapted for focussing an optical beam on said information surface;

15 - a swing arm assembly comprising a generally elongate swing arm structure supporting said focussing lens assembly at a free end, the swing arm assembly being rotatable about a swing axis spaced from said free end and directed substantially perpendicularly to the swing arm structure and generally parallel to said spindle axis, the swing arm assembly also comprising a movable magnetic focussing means provided near said free end of the swing arm assembly for driving said focussing lens along said focussing axis so as to focus said optical beam on the optical disc information surface;

the optical disc apparatus also comprising:

20 - a stationary magnetic focussing means associated with the supporting assembly for magnetically cooperating, through an intermediate air gap, with said movable focussing means in order to generate a magnetic force vector having a vector component parallel to said focussing axis so as to drive the focussing lens assembly along said focussing axis,

25 the stationary and movable magnetic focussing means being disposed and cooperating such that said force vector component intersects said focussing lens area.

2. An optical disc apparatus as claimed in claim 1, wherein said force vector component generally coincides with the focussing axis of said focussing lens.

3. An optical disc apparatus as claimed in claim 1 or 2, wherein

- the optical lens assembly comprises, near said free end of the arm assembly, a perpendicularly reflecting optical element connected to the focussing lens, having a reflective surface on the side of the focussing lens which is directed away from the information surface of the optical disc, when supported by the spindle, and causes reflection of a laser beam travelling in the general direction between the swing axis and the focussing axis so as to travel through the focussing lens generally along the focussing axis, and

- the movable magnetic focussing means are connected to the reflecting element in a position on the side of said reflecting surface which is directed away from the movable focussing lens.

4. An optical disc apparatus as claimed in claim 3, wherein

- the swing arm assembly is bounded by spaced virtual parallel flat planes extending perpendicularly to the swing axis, a first plane being nearer to the optical disc, when supported by the spindle, and a second plane being more remote from said optical disc;

- at least a portion of the reflecting element is inwardly spaced from said second plane, so that an intermediate space is provided between the reflecting element and said second plane; and

- the stationary magnetic focussing means extend into said intermediate space between the reflecting element and said second plane, thus occupying at least a portion of said intermediate space.

5. An optical disc apparatus as claimed in any of the claims 2 to 4, wherein the movable and stationary magnetic focussing means cooperate through an air gap which is generally parallel to said reflecting surface of the reflecting element.

6. An optical disc apparatus as claimed in any of the previous claims, wherein the stationary magnetic focussing means are configured as arcuate permanent magnetic circuit means and the movable magnetic focussing means are configured as electrical magnetic coil means.

7. An optical disc apparatus as claimed in claim 6, wherein

- the reflecting surface of the focussing lens assembly is disposed in an inclined plane relative to the swing axis of the swing arm assembly;

- said movable electrical magnetic coil means are disposed generally in an inclined plane parallel to the reflecting surface; and

5 - said stationary magnetic circuit means comprise an inclined face directed towards said movable electrical magnetic coil means, such that the said air gap between said movable electrical magnetic coil means and said stationary magnetic circuit means is disposed in an inclined plane generally parallel to said inclined reflective surface of the focussing lens assembly.

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8. An optical disc apparatus as claimed in claim 1, wherein the swing arm structure comprises two spaced elongate generally parallel flat resilient arm elements which extend between the swing axis and the focussing lens assembly, and are interconnected at or near the free end of the swing arm assembly by the focussing lens assembly.